# Support for Protocols

## Overview

This proposal is to introduced a new property to specify the transport mechanism of a bus. The new property can be integrated as an errata for the current AADL standard.

## Rationale

Specifying the transport protocol for a bus is helpful from an analysis and code generation point of view. From an analysis perspective, it can help to reason about the system and detect protocols that are not appropriate. For example, in critical systems, using a complex protocols might introduce some risks (e.g. exposure of a failure of the protocol stack). From a code generation perspective, it provides the necessary information to generate the communication code (e.g. underlying middleware).

Such a property is already included in the Ocarina toolsuit. This proposal consists in standardizing such a property.

## Property Definition

We propose the following new property in the Deployment Properties.

Transport\_Protocol : AADL\_Project::Allowed\_Transport\_Protocol applies to (bus);

In addition, we propose the following enumeration in AADL\_Project:

 Allowed\_Transport\_Protocol : type enumeration
 (tcp\_ip,
 can,
 bluetooth,
 spaceWire);

List of protocols (Allowed\_Transport\_Protocol) is not yet fixed and can be extended per committee recommendations.

## Example

The following example illustrates the use of the new property with two systems communicating over a bus using TCP/IP.

package transport\_protocol
public
 data mydata
 end mydata;

 processor cpu
 features
 ethaccess : requires bus access eth;
 end cpu;

 process s
 features
 dataout : out data port mydata;
 end s;

 process r
 features
 datain : in data port mydata;
 end r;

 bus eth
 properties
 Deployment\_Properties::Transport\_Protocol => tcp\_ip;
 end eth;

 system integration
 end integration;

 system implementation integration.i
 subcomponents
 s : process s;
 r : process r;
 b : bus eth;
 ps : processor cpu;
 pr : processor cpu;
 connections
 c0 : port s.dataout -> r.datain;
 b0 : bus access b <-> ps.ethaccess;
 b1 : bus access b <-> pr.ethaccess;
 properties
 Actual\_Connection\_Binding => (reference (b)) applies to c0;
 actual\_processor\_binding => (reference (pr)) applies to r;
 actual\_processor\_binding => (reference (ps)) applies to s;
 end integration.i;
end transport\_protocol;